TRENDS IN FOOD SCIENCE & TECHNOLOGY
Volume 1
CONTENTS

REFERENCE EDITION

1990

JULY

EDITORIAL

Addressing the issues: food science in the 1990s 1

REVIEWS

Starch gelation and retrogradation, by V.J. Morris 2
The molecular basis of starch gelation and retrogradation is re-examined in the light of recent evidence

The detection of irradiated foodstuffs, by Martin Grootveld, Reetu Jain, Andrew W.D. Claxson, Declan Naughton and David R. Blake 7
An overview of the methods for detecting irradiated foods, including an appraisal of high-field ^{1}H NMR as a method for distinguishing between irradiated and non-irradiated foods

High pressure technology in the food industry, by David Farr 14
The use of ultra-high pressure technology may offer attractive new processing strategies for manufacturers who have, hitherto, had to rely on thermal processing

CONFERENCE REPORT

Micronutrients and health, I: vitamins, by Colette Shortt 17
An analysis of the important points to emerge from this conference held in Norwich, UK, in March

VIEWPOINTS

In search of alternative mechanisms for the Maillard reaction, by V. Yaylayan 20
Direct dehydration of the cyclic forms of Amadori rearrangement products is proposed as an alternative to enolization of the open-chain tautomer

Toxicity of disease-resistant plant strains, by G.R. Fenwick, I.T. Johnson and C.L. Hedley 23
Plant breeders need to be aware of the concerns of food scientists and toxicologists when selecting plant strains for disease resistance

BOOK REVIEWS

Frontiers in Carbohydrate Research (Vol. 1): Food Applications (R.P. Millane, J.N. BeMiller and R. Chandrasekaran, eds), by Gordon G. Birch 26

The Maillard Reaction in Aging, Diabetes, and Nutrition (Progress in Clinical and Biological Research, Vol. 304) (J.W. Baynes and V.M. Monnier, eds), by John O'Brien 26

Micronutrients in Milk and Milk-Based Food Products (E. Renner, ed.), by Albert Flynn 27

Fermented Milks and Health (Proceedings of a workshop held in Arnheim, The Netherlands, in 1989), by Zdenko Puhan 28

JOURNAL CLUB 29

NEWS 30

AUGUST

EDITORIAL

Of food proteins, peptides and pharmacology 33

FEATURE

Identification and characterization of glass fragments in foods, by Jane F. Heathcock and R.K. Gibson 34
Glass contamination of a food product is a serious quality assurance problem necessitating rapid assessment of the source and nature of the contamination

REVIEWS

Objective indices of cheese ripening, by Nana Y. Farkye and Patrick F. Fox **37**
The assessment of cheese ripeness has traditionally been conducted by subjective organoleptic assessment. The development of chemical and physical indices of cheese ripeness offers more objective approaches to studying the cheese ripening process

Milk proteins: precursors of bioactive peptides, by Hans Meisel and Eckhard Schlimme **41**
Some peptides derived from milk proteins have recently been shown to have opioid activity *in vivo*

FOOD ANALYSIS UPDATE

Near-infrared reflectance analysis: food industry applications, by Philip C. Williams and Susan G. Stevenson **44**
In recent years, near-infrared reflectance analysis has been applied widely in the food industry. This review examines the existing applications and provides guidelines for adapting the technique to new applications

BOOK REVIEWS

Fat-Soluble Vitamin Assays in Food Analysis: A Comprehensive Review (G.F.M. Ball), by K. John Scott **49**

Biology of Food Irradiation (D.R. Murray), by William R. Obermeyer **49**

Biotechnology Applications in Beverage Production (C. Cantarelli and G. Lanzarini, eds), by David Berry **50**

Extrusion Cooking (C. Mercier, P. Linko and J.M. Harper, eds), by F.R. van de Voort **50**

JOURNAL CLUB **51**

NEWS **52**

SEPTEMBER

EDITORIAL

Bringing science to market **55**

REVIEWS

Strategies for iron fortification of foods, by R.F. Hurrell and J.D. Cook **56**
Iron deficiency anaemia is still a major nutritional problem in many parts of the world. One strategy for overcoming the problem is to increase iron intake by dietary supplementation

Glass transitions in low-moisture foods, by T.R. Noel, S.G. Ring and M.A. Whittam **62**
The significance of the glass transition to the stability and physicochemical properties of foods is being increasingly recognized. Knowledge of the glass transition is proving to be a valuable tool in developing new products

Toxicity of dietary lipid peroxidation products, by Stan Kubow **67**
Many of the products of lipid peroxidation are toxic; some may be aetiological factors in heart disease. However, the formation of high levels of such compounds in foods is largely avoidable

VIEWPOINT

The basis of dietary fat preferences, by D.J. Mela **71**
The factors that determine the acceptability and ingestion of dietary fat are still unclear. There is evidence that fat-associated flavours or the metabolic properties of fats may be involved

BOOK REVIEWS

Computerized Food Processing Operations (A.A. Teixeira and C.F. Shoemaker), by Israel Saguy **73**

Nutritional Factors in Hypertension (Contemporary Issues in Clinical Nutrition, Vol. 12) (H. Langford, B. Levine and L. Ellenbogen, eds), by J.V. Joossens **74**

Potato Science and Technology (G. Lisinska and W. Leszczynski, eds), by Nell Mondy **75**

Progress in Sweeteners (T.H. Grenby, ed.), by M. Mathlouthi **75**

Development and Application of Immunoassays for Food Analysis (J.H. Rittenburg, ed.), by M.N. Clifford **76**

JOURNAL CLUB **77**

OCTOBER

EDITORIAL

Towards a reduction in the use of animals in food research 79

CURRENT AWARENESS

New rapid method for the detection of *Salmonella* in foods, by Paul K. Wolber and Robert L. Green 80
The specificity of phage-typing assays has been combined with the sensitivity of using a 'reporter' gene that encodes a bacterial ice nucleation protein

REVIEWS

Immunochemical methods for mycotoxin detection in food products, by Thomsen J. Hansen 83
Food manufacturers and consumers are becoming increasingly concerned about mycotoxin contamination of food products. This review examines some of the methods available for detecting such contamination

Chemical indices of food decomposition, by S. Mathews, R.S. Singhal and P.R. Kulkarni 89
Despite the ever-increasing sophistication of modern analytical methods, chemical indices of food quality are still of value because they are cheap, easy to interpret, and versatile

BOOK REVIEWS

Food Toxicology – A Perspective on the Relative Risks (S.L. Taylor and R.A. Scanlan, eds), by D.M. Conning 92

Energy Metabolism in Animals and Man (Kenneth Blaxter), by Peter R. Murgatroyd 92

Copper Bioavailability and Metabolism (Advances in Experimental Medicine and Biology, Vol. 258) (Constance Kies, ed.), by John J. Strain 93

Principles and Applications of Gas Chromatography in Food Analysis (Michael H. Gordon, ed.), by Denis A. Cronin 94

Fluorescence Analysis in Foods (Lars Munck, ed.), by Richard D. Ludescher 95

JOURNAL CLUB 96

NEWS 97

NOVEMBER

EDITORIAL

Perspectives on toxic hazards in foods 99

FEATURE

Low-temperature microscopy and X-ray analysis of food systems, by B.E. Brooker 100
Electron microscopy is being applied increasingly in food research. This article reviews the specific applications of low-temperature electron microscopy and X-ray microanalysis of food systems

REVIEWS

HACCP: A re-emerging approach to food safety, by Robert L. Buchanan 104
Almost 30 years after its introduction, hazard analysis and critical control point (HACCP) methodology is re-emerging as a powerful approach to the quality control of foods

Developments in food packaging technology. Part I: Processing/cooking considerations, by James P. Smith, Hosahalli S. Ramaswamy and Benjamin K. Simpson 107
New packaging technologies are having a major impact on the manufacture and marketing of foods. Part I of this two-part series reviews aseptic and UHT packaging and the packaging of microwavable foods

Developments in food packaging technology. Part II: Storage aspects, by James P. Smith, Hosahalli S. Ramaswamy and Benjamin K. Simpson 111
This review examines the role of new packaging technology in the storage of foods: modified atmosphere packaging and *sous-vide* processing

CONFERENCE REPORTS

Biosensors '90. The first world congress on biosensors, by Andrew O. Scott 119
Biosensor technology may revolutionize the industrial processing of foods

200th American Chemical Society national meeting, by John O'Brien 122
The key trends of the 200th American Chemical Society national meeting are analysed

BOOK REVIEWS

Food Colloids (R.D. Bee, P. Richmond and J. Mingins, eds), by D.D. Muir 125

Omega-6 Essential Fatty Acids: Pathophysiology and Roles in Clinical Medicine (D.F. Horrobin, ed.), by Klaus W.J. Wahle 125

Biotechnology Challenges for the Flavor and Food Industry (R.C. Lindsay and B.J. Willis, eds), by D.L. Pyle 126

Quality and Preservation of Vegetables (N.A. Michael Eskin, ed.), by David Arthey 127

International Food Regulation Handbook: Policy, Science, Law (R.D. Middlekauf and P. Shubik, eds), by Stephen J. Fallows 128

Statistical Aspects of the Microbiological Analysis of Foods (Progress in Industrial Microbiology, Vol. 21) (B. Jarvis), by D.C. Kilsby 128

JOURNAL CLUB 129

NEWS 131

DECEMBER

EDITORIAL

Instrumental Progress 133

FEATURE

Magnetic resonance imaging applications in food research, by Michael J. McCarthy and Robert J. Kauten 134
Magnetic resonance imaging is a powerful new tool for the study of food structure and quality

REVIEWS

Topical aspects of fermented foods, by M.R. Adams 140
With the increasing consumer appeal of fermented foods, the market for such products is growing. This review examines the preservation and safety aspects of fermented foods and discusses possible benefits to health from their consumption

Molecular dynamics of food proteins: experimental techniques and observations, by Richard D. Ludescher 145
The nature of the molecular motions of proteins in food systems is reviewed in the context of the relationship between molecular dynamics and the functionality of such proteins

Control of the Maillard reaction in food systems, by Jennifer M. Ames 150
An understanding of the important factors influencing the Maillard reaction provides a basis for its industrial exploitation to manufacture products of consistent quality

CONFERENCE REPORT

The first world congress on the health significance of garlic and garlic constituents, by John O'Brien 155
The first world congress on the health significance of garlic examined the scientific data that suggest that some constituents of garlic may have beneficial effects in certain disease states

BOOK REVIEWS

Microstructural Principles of Food Processing and Engineering (J.M. Aguilera and D.W. Stanley), by Miloslav Kalab and Karen Lapsley 158

Safety of Irradiated Foods (J.F. Diehl), by Dennis V. Parke 159

Food Emulsifiers: Chemistry, Technology, Functional Properties and Applications (G. Charalambous and G. Doxastakis, eds), by P. Walstra 160

BOOKS RECEIVED 161

NEWS 162